

In the Claims

Claims 1, 12, 18 and 19 have been amended and claims 5 and 8 - 11 have been cancelled. Claims 1 - 4, 6, 7 and 12 - 19 remain in the application as follows:

1. (Currently Amended) A voltage-controlled tunable filter including:

an input;

an output;

a plurality of resonators serially coupled to each other and to the input and the output;

a plurality of tunable capacitors, each of the tunable capacitors being coupled to one of

the resonators;

said tunable capacitors comprising, a first electrode; a tunable dielectric film positioned on the first electrode; and a second electrode positioned on a surface of the tunable dielectric film opposite the first electrode and wherein for operation at frequencies ranging from 1.0 GHz to 10 GHz, the loss tangent would range from 0.001 to 0.005; for operation at frequencies ranging from 10 GHz to 20 GHz, the loss tangent would range from 0.005 to 0.01; for operation at frequencies ranging from 20 GHz to 30 GHz, the loss tangent would range from 0.01 to 0.02; and

means for coupling non-adjacent ones of the resonators.

2. A voltage-controlled tunable filter according to claim 1, wherein each of the resonators includes one of:

a microstrip, a stripline, a coaxial line, a dielectric resonator, or a waveguide.

3. A voltage-controlled tunable filter according to claim 1, wherein the means for coupling non-adjacent ones of the resonators comprises a series connection of an additional tunable capacitor and a conductor.

4. A voltage-controlled tunable filter according to claim 1, wherein the plurality of resonators are mounted on a substrate.

5. Canceled

6. A voltage-controlled tunable filter according to claim 51, wherein the tunable dielectric film comprises:

barium strontium titanate or a composite of barium strontium titanate.

7. A voltage-controlled tunable filter according to claim 1, wherein each of the tunable capacitors comprises:

a substrate;

a tunable dielectric film positioned on the substrate; and

first and second electrodes positioned on a surface of the tunable dielectric film opposite the substrate, the first and second electrodes being separated to form a gap.

8. Canceled

9. Canceled

10. Canceled

11. Canceled

12. (Currently Amended) A voltage-controlled tunable filter according to claim 1, wherein the input includes a first microstrip line having an end capacitively coupled to a first one of the resonators; and wherein the output includes a second microstrip line having an end capacitively coupled to a second one of the resonators.

13. A voltage-controlled tunable filter according to claim 1, wherein each of the resonators comprises a microstrip line.

14. A voltage-controlled tunable filter according to claim 13, wherein the microstrip lines are positioned parallel to each other on a substrate.

15. A voltage-controlled tunable filter according to claim 13, wherein the coupling means comprises:

an additional microstrip line having first and second ends, each capacitively coupled to one of the resonator microstrip lines.

16. A voltage-controlled tunable filter according to claim 15, wherein coupling means further comprises:

an additional tunable capacitor connected in series with the additional microstrip line.

17. A voltage-controlled tunable filter according to claim 1, wherein each of the tunable capacitors comprises a tunable dielectric capacitor including a layer of voltage tunable dielectric material.

18. (Currently Amended) A voltage-controlled tunable filter according to claim 1, wherein the ~~layer of tunable dielectric~~ film-material comprises a material selected from the group of:

$\text{Ba}_x\text{Sr}_{1-x}\text{TiO}_3$, $\text{Ba}_x\text{Ca}_{1-x}\text{TiO}_3$, $\text{Pb}_x\text{Zr}_{1-x}\text{TiO}_3$, $\text{Pb}_x\text{Zr}_{1-x}\text{SrTiO}_3$, $\text{KTa}_x\text{Nb}_{1-x}\text{O}_3$, lead lanthanum zirconium titanate, PbTiO_3 , BaCaZrTiO_3 , NaNO_3 , KNbO_3 , LiNbO_3 , LiTaO_3 , PbNb_2O_6 , PbTa_2O_6 , $\text{KSr}(\text{NbO}_3)$ and $\text{NaBa}_2(\text{NbO}_3)_5\text{KH}_2\text{PO}_4$, and compositions thereof.

19. (Currently Amended) A voltage-controlled tunable filter according to claim 18, wherein the ~~layer of tunable dielectric~~ film-material further comprises a non-tunable component.